

Assess. Equip. Insert. Inform.



Drone Defender



Electronic Warfare
Tactical Vehicle



EMI Shield



Unmanned Aerial System

Army REF Overview Brief

16 DEC 2019

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MISSION AND CORE FUNCTIONS



The Rapid Equipping Force (REF) **provides** innovative **materiel solutions** to meet the **urgent requirements** of U.S. Army forces employed globally, **informs** materiel development for the **future force**, and on order **expands** to meet operational demands.

ASSESS emerging combat requirements; identify commercial and government off-the-shelf solutions and technologies to equip the warfighter.

INSERT future force technologies, threshold capabilities and/or surrogates into operational forces to speed development and validate concepts in an operational environment.

EQUIP operational forces with urgent solutions in order to reduce operational capability shortfalls, increase Soldier safety and reduce risk.

INFORM HQDA, TRADOC, ASA(ALT), AFC, AMC, Centers of Excellence, maneuver elements, and the greater Army of REF assessments and information received.

Army REF delivers! We don't want to break this. – Honorable Ryan McCarthy (USA)

REF: PAST, PRESENT, AND FUTURE



PAST *2002- Afghanistan*

Soldiers conducting combat operations sustained casualties from booby traps and grenade blow-back while searching and clearing caves.

Solution:

Then Vice Chief of Staff of the Army formed a task force to identify and test commercial-off-the-shelf robots. In less than 30 days, the team procured the PackBot and travelled to theater for operational testing; the equipping success led to a new organization, the U.S. Army Rapid Equipping Force.



PRESENT *2018 – FORSCOM*

Army electronic warfare officers have limited tools to detect/attack enemy communications and networks at the tactical level

Solution:

The REF has tested and equipped the EWTV, which provides a sensing and jamming capability of enemy communications and networks from an operationally relevant range. The vehicles are designed to be self-contained and independent, operated by Electronic Warfare Soldiers within the vehicle.



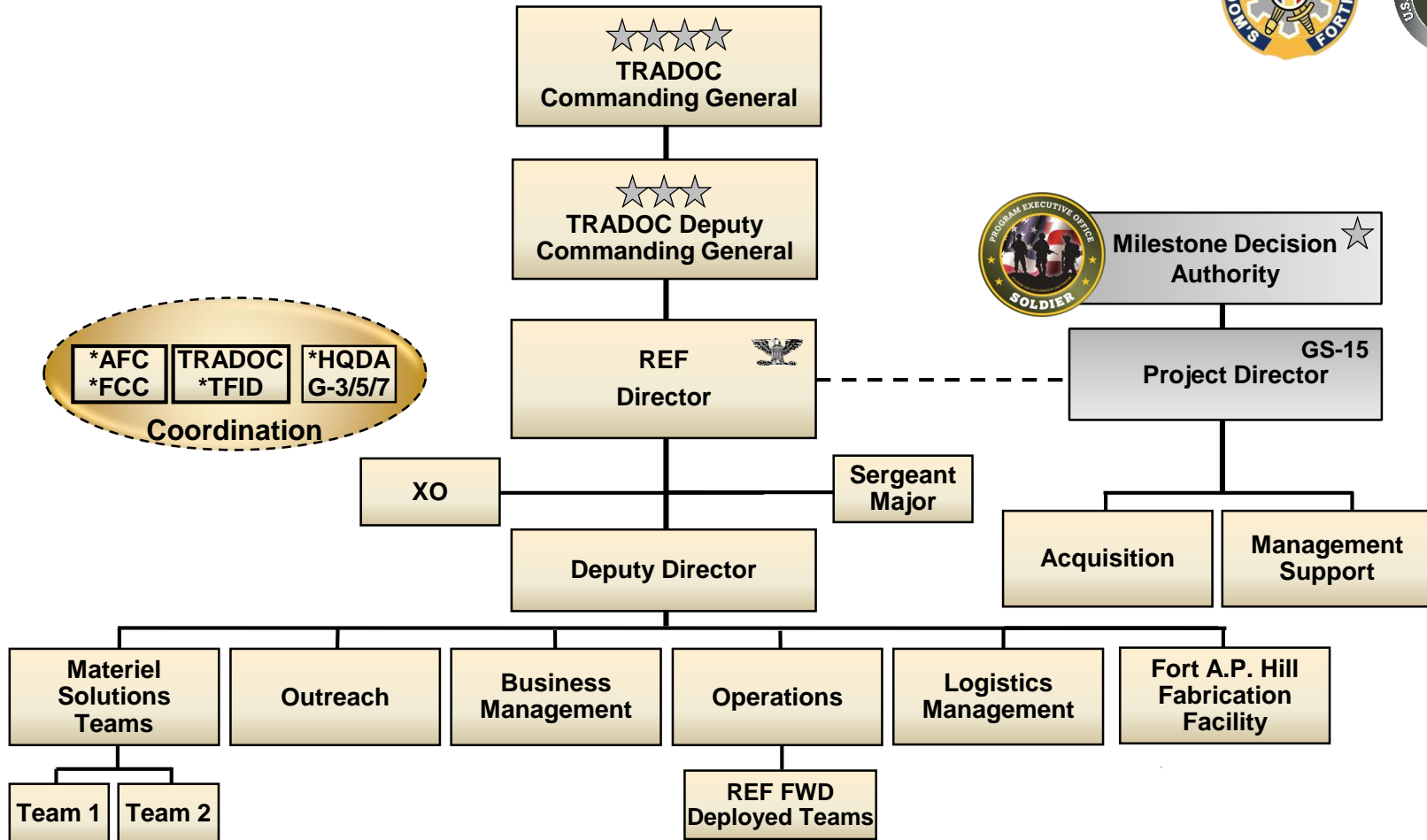
FUTURE *2020-2028*

Soldiers around the globe require rapid materiel solutions to ever increasingly complex problems. Our Warfighters require advanced technology that does not simply optimize intelligence information to get it to the Warfighter, it needs to make sense to the decision maker at the leading edge.

Solution:

The U.S. Army REF will provide solutions that meet the demands that enhances Soldiers' readiness and Soldier protection by rapidly equipping readily available modern technology and/or rapidly prototyping limited solutions at the point-of-use.

TASK ORGANIZATION



*Acronyms

- Army Futures Command (AFC)
- Futures and Concepts Center (FCC)
- TRADOC Force Integration Directorate (TFID)
- Headquarters, Department of the Army (HQDA)

— Direct Support / Facilitation

- - - Technology Information Sharing / Coordination / Synchronization

UNIQUE AUTHORITIES



REF is rapid because it combines requirement validation, flexible funding, and acquisition authority under one roof.



REQUIREMENT VALIDATION

- HQDA, G-3/5/7 delegated requirement approval authority to REF Director via submitted 10-Liner or Director's Initiative to leverage technologies for identified capability gaps.
- HQDA, G-3/5/7 retains the authority to direct **ONS** on perceived Army problem sets.



FUNDING

- REF is appropriated a mixture of base and OCO OMA, OPA, and RDTE funds enabling the agility to fulfill requirements from globally deployed forces.



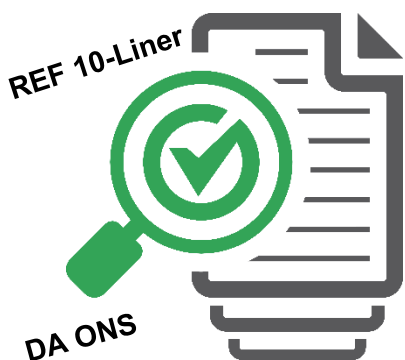
ACQUISITION

- ASA(ALT) designated PEO-Soldier as REF's Milestone Decision Authority (MDA) (May 28, 2014).
- REF Project Director reports to PEO-Soldier and provides direct acquisition support to the REF.
- Limited acquisition; not an ACAT program.



HOW REF EQUIPS SOLDIERS

Receive & Validate Urgent Materiel Requirements



Deliver Material Solutions



Materiel Solution Sustainment / Disposition



Goal of 180 Days or Less

As Required, Goal of Less than 2 Years

Requirements Validation

- Receive urgent Warfighter requirement from globally employed Soldiers.
 - Unit coordination
 - De-conflict with DA G38
- Mission Analysis, assesses the problem and provides recommendations to the Director
- ★ Director either:
 - Validates Capabilities Requirement Document (CRD)
 - Recommends PM fill
 - Non support and returns
- Passes a MFR to requesting unit CDR/O6 for awareness

CSP/Equipping Approval

- Refine mission analysis; researches potential technology solutions and develops **Cost, Schedule, Performance (CSP) Plan**.
- Options: **COTS/GOTS** or conducts
- Limited development/integration
- Initiates shipment & delivery
- Identify potential transition pathway

Delivery, Assessments & Follow-up

- Establish property accountability with requesting unit & MOA
- Continuous feedback on the equipped technology's performance
- Provides hasty DOTM to inform both internal REF decisions and broader Army decisions

Transition Decision

- ★ One year after delivery, begin property disposition analysis recommendation for TRADOC: **terminate**, **sustain**, or **transition**
- Terminate an effort
- Sustain on battlefield & expand equipping to additional units
- Transition to program of record or office of primary responsibility as enduring capability

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REF PARTNERSHIPS



Globally Employed Units



Federal Research Laboratories and Government Agencies



Industry & Academia

Access to Materiel Solutions



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WORLDWIDE SUPPORT TO THE FIELDIED FORCE



Protection

- Counter UAS
- Electronic Warfare
- Vehicle barriers
- Big Voice Notification
- CCTV (DOG System)
- Containerized Weapon Systems



Containerized Weapon System (CWS)



EW Tactical Vehicle (EWTV)



Modular Protective Guard Shack

Movement + Maneuver

- GPS Denied and Electromagnetically contested environments
- SFAB Support
- Robotic Platforms
- Subterranean Operations



End User Displays



Robotics



Wave and/or MESH networked Radios

Intelligence

- Squad ISR
- Small AEROSTATS
- Persistent ISR
- SIGINT systems
- Kraken



Black Hornet (nano-Drones)



Tactical Aerostat



Tethered ISR

Sustainment

- Medical Readiness
- Tactical Edge Communications Kit – VSAT
- Reduction of sustainment through rapid prototyping



TECK-V



Blood Coolers



Expeditionary Lab (EXLAB)

Fires



Drone Buster



Drone Defender



Switchblade Drone (LMAMS)



Instant Eye

Mission Command

- Subterranean (SubT) Operations
- LOS & NLOS Comms
- SFAB Support
- Communication interoperability



C5ISR



GATR Ball (Tactical SATCOM)



TOC in a Box

Training + Assessment

- >30 x Unit Outreach Visits
- >50 x Equipment Training/MTTs Conducted
- 20 x PAX deployed in support of ARCENT
- Partnered with CALL and AWG



TUAS Training



PARC Training



"REF is a great outfit, supported thousands of globally deployed Soldiers over the years and will continue to be a valuable Army resource in the future." – GEN (R) Votel

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REF ENHANCED CAPABILITIES



Ex Lab (Bagram, Afghanistan)

REF Fabrication Facility (Fort A.P. Hill, VA)

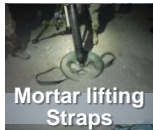
Machining + Welding + Sheet Metal + Fabrication + 3D Printing + Paint Booth



Identify Problem

Design/Refine Prototype

Fabricate



Mortar lifting Straps



Crows Lens Cover



Vehicle Optic Sensor System Protection



Press Brake



Industrial Printers



Laser Water Jet



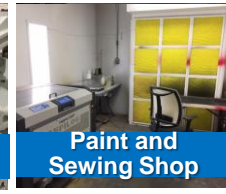
FARO Arm



Hardness Tester



Manual Lathe



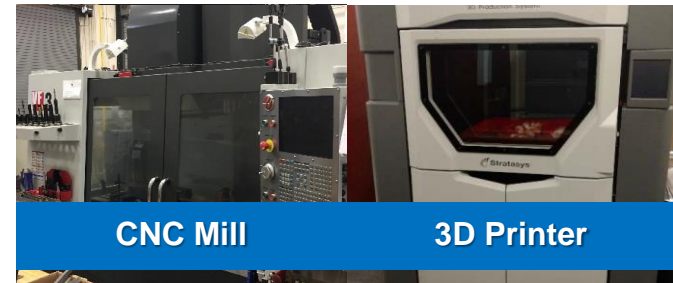
Paint and Sewing Shop



CNC Lathe

Additional Ex Lab capabilities:

- Globally deployable containerized system
- Readily transportable via air, land, sea or rail
- Mobile power generation with secure communication
- Lead engineer onsite



CNC Mill

3D Printer

Improves Soldier readiness and Soldier protection

- Rapidly prototype and engineer solutions for select replacement parts and force protection measures at the point of need
- REF subject matter experts accompany units to observe potential requirements firsthand

FUTURE TECHNOLOGY INVESTMENTS



Electronically Degraded Environment

UAS / CUAS Technologies

Dense Urban Terrain

Surveillance

Signature Reduction



IP Based Communications

Assured Communications
Expeditionary Communications in all operational environments



Interoperability Systems

Mission Command
Effectively communicate and provide information to leaders



Android Tactical Assault Kit

Software Network
Synchronization of expeditionary data/communication



GoTenna

Antennas
Expeditionary; supporting legacy and emerging waveforms



Deployable Passive Repeater Ribbon

Passive Repeater
Compact system assisting in omni-directional radiation of signals commonly used on mesh network radios.



Skyview

Early Warning
Expeditionary capability to detect all UAS and ground systems



Pegasus

Expeditionary ISR
Rapid deployable, anti-jam, Non GPS reliant, endurance, payload capabilities



Smart Shooter

Kinetic capabilities
Physically disrupt or destroy unmanned systems



Drone Defender

Non-Kinetic capabilities
Ability to Detect, Identify, Disrupt UAS



Dedrone

Standoff / Close Contact Engagement
Layered defense



Air Jam



Flexible Pressure Vessel

Movement /Protection
Lightweight and Reinforced Breathing Apparatus



E-Blanks

Movement /Protection
Environmentally friendly; simulates the firing of ammunition



Intelligent 5KW

Power/Water Capabilities
Water/soldier/vehicle energy efficiency /power generation



Voice Projection Unit (VPU) GEN II

Movement /Protection
Waterproof microphone assembly for MPU-5



510 Robot

Robotics
Remote Tunnel Mapping 2-D and 3-D tunnels and room images



Ghost 60

Squad ISR Refresh
The REF continues to receive Squad ISR requirements on top systems equipped



Altus

Tethered ISR Refresh
Communications and awareness



Camera, Thermal

Camera Systems
Optical system visual, recording, thermal



SOTER PARC

Autonomous Systems
Network of networks, single entity



PUMA

Camera Systems
Facilitate remote viewing of video wireless or hard line



Tinhat

EM Reduction
Deter or mitigate electro-magnetic interference



EWTV
Dedicated ES/EA tactical vehicle for mobile BCT support



Head-up display

Optical Augmentation



Multi-Spectral mobile Camouflage

Camouflage Personnel & Vehicle
Concealment / Friend or Foe



Artificial Intelligence
Reduce Soldier cognitive load

The REF is the Army's lead for immediate materiel solutions—we are the Army's Quick Reaction Capability (QRC)



WARFIGHTER leadership teamwork
materiel solutions DA Civilians Military
Contractor **MISSION** autonomy authori
PEOPLE integrity pride quality equipme
speed **CAPABILITY** requirements fast
solution **LOYALTY** ideas technical
proficiency **INITIATIVE** materiel solution
TEAMWORK **WARFIGHTER** leader
teamwork materiel solutions DA Civilian
Military Contractor **MISSION** authori
authorities **PEOPLE** integrity pride
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warfighter **LEADERSHIP** teamwork

TEAMWORK materiel solutions C
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MILITARY contractor **MISSION**
autonomy authorities people
INTEGRITY
speed capabil
solution loyalty
TECHNICAL PROFICIENCY
initiative materiel solution **TEAM**
TEAMWORK materiel solution
Civilians **WARFIGHTER** leader
MILITARY c
autonomy aut
INTEGRITY
quality equipm
requirements
ideas **TECHNICAL**

WHAT THE REF VALUES!



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